

09/900,248  
DP-302,682



Express Mail Label No. ET931279488US

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re: Buening et al.

Examiner: Le, Dang D.

Serial No.: 09/900,248

Art Unit: 2834

Filed: 07/06/2001

For: ROTOR FOR AN AC GENERATOR

Docket No.: DP-302,682

**APPEAL BRIEF**

Mail Stop APPEAL BRIEF – PATENTS  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Dear Sir:

Appellants submit, in triplicate, the following Appeal Brief pursuant to 37 C.F.R. § 1.192 for consideration by the Board of Patent Appeals and Interferences. Please charge the cost of filing the opening brief, namely \$320.00, as required under 37 C.F.R. § 1.17(c) to Deposit Account No. 04-2223. No oral hearing is requested. No extension of time is believed necessary. Please charge any additional fees or credit any overpayment to the same account.

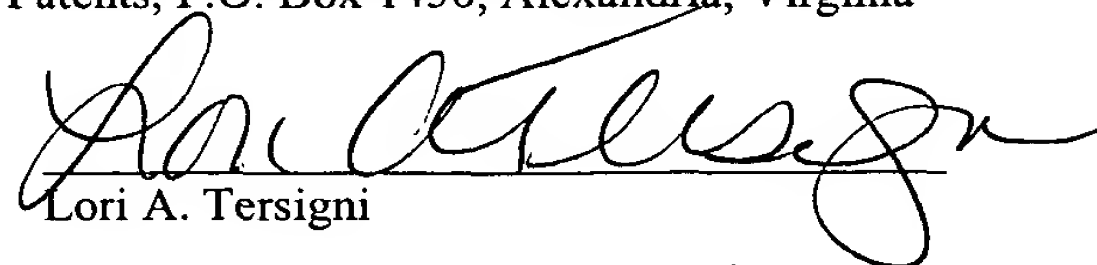
---

**CERTIFICATE OF EXPRESS MAILING**

Express Mail Label No. ET931279488US  
Date of Deposit: June 17, 2003

I hereby certify that this Appeal Brief pursuant to 37 C.F.R. § 1.192 is being deposited with the United States Postal Service as Express Mail "Post Office to Addressee," postage prepaid, in an envelope addressed to Mail Stop APPEAL BRIEF – PATENTS, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

06/19/2003 AMONDAF1 00000076 042223 09900248  
01 FC:1402 320.00 DA

  
Lori A. Tersigni



**TABLE OF CONTENTS**

I.	REAL PARTY IN INTEREST .....	1
II.	RELATED APPEALS AND INTERFERENCES .....	1
III.	STATUS OF CLAIMS.....	1
IV.	STATUS OF AMENDMENTS.....	1
V.	SUMMARY OF INVENTION .....	1
VI.	ISSUES.....	3
VII.	GROUPING OF CLAIMS .....	3
VIII.	ARGUMENTS .....	3
	A.    Argument Directed to the Allowance of Selected Groupings of the Claims .....	3
	1.    Argument for Allowance of the Claims of Group 1 (Claims 1 and 9) .....	3
	2.    Argument for Allowance of the Claims of Group 2 (Claims 3-8) .....	8
	3.    Argument for Allowance of the Claim of Group 3 (Claim 10).....	9
	B.    Conclusion.....	10
IX.	APPENDIX .....	A-1



TABLE OF AUTHORITIES

Cases

<i>Ex parte Clapp</i> , 227 U.S.P.Q. 972, 973. (Bd. Pat. App. & Inter. 1985).....	4
<i>In re Gordon</i> , 733 F.2d 900, 221 USPQ 1125, 1127 (Fed. Cir. 1984).....	8
<i>In re Ratti</i> , 270 F.2d 810, 123 USPQ 349, 352 (CCPA 1959).....	8
<i>In re Vaeck</i> , 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991) .....	4, 10

Statutes

35 U.S.C. § 103(a).....	3, 8, 9
-------------------------	---------

Other Authorities

M.P.E.P. § 2142.....	10
M.P.E.P. § 706.02(j).....	4



### **I. REAL PARTY IN INTEREST**

The real party in interest is the Assignee, Delphi Technologies, Inc.

### **II. RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences known to the Appellants, Appellants' legal representative, or Assignee, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

### **III. STATUS OF CLAIMS**

Claims 1 and 3-10 are pending. Claims 1 and 3-10 are under consideration and remain rejected. The Office had also objected to claim 10, however, Appellants believe that this objection has now been overcome in light of the amendment made to claim 10 filed on January 24, 2003 in response to the Final Office Action dated October 24, 2002. Accordingly, Appellants hereby appeal the rejection of claims 1 and 3-10.

### **IV. STATUS OF AMENDMENTS**

An amendment after the Final Office Action dated October 24, 2002 was made to Claim 10 on January 24, 2003. Pursuant to the Advisory Action mailed to Appellant on April 1, 2003, this amendment has been entered for purposes of appeal.

### **V. SUMMARY OF INVENTION**

The present invention relates to an alternating current (AC) generator that includes a pair of rotor segments provided with interleaved pole teeth or fingers, and a rotor core that carries a field coil.<sup>1</sup> In conventional, thirty-six stator tooth, twelve rotor pole 3-phase configurations, the rotor tooth is generally formed to be of trapezoidal shape having a tip side, a base side opposite the tip side, a leading side, and a trailing side.<sup>2</sup> A problem with

---

<sup>1</sup> See page 1, lines 10-12 of the Specification.

<sup>2</sup> See page 1, lines 12-15 of the Specification.

these conventional AC generators having teeth is that they exhibit a magnetic sound that is produced during operation, which may be found objectionable.<sup>3</sup>

Steps have been taken to cure this undesirable occurrence. Approaches taken in the art to reduce this noise include skewing the leading side of the tooth in the direction of movement, which results in the centerline of the tooth being moved toward the leading side, and no longer bisecting both the tip and the base into approximately equal halves.<sup>4</sup> Another approach taken is to provide a claw tooth rotor having irregular trapezoidal shaped teeth, wherein the tip is displaced in the direction of rotation.<sup>5</sup> However, there is still a need for an improved a generator, and/or parts thereof, that continuously improve the reductions in the level of noise, while maintaining or improving the electrical efficiency of the generator.

An AC generator in accordance with the present invention satisfies this need. The generator of the present invention includes an armature core having a plurality of teeth separated by intervening slots spaced according to slot pitch.<sup>6</sup> The generator includes at least one multiphase winding disposed on the armature core,<sup>7</sup> and a rotor disposed in the armature having a plurality of pairs of rotor teeth, each pair respectively configured for energization in opposite magnetic polarity.<sup>8</sup> Each tooth has a trapezoidal shape having a base, a leading side, a trailing side, and a tip side, wherein the leading side has a plurality of portions.<sup>9</sup> In a preferred embodiment, the leading side has a first portion extending from the tip (toward the base) sloping at a first rate, and a second portion extending away from the first portion (also toward the base) sloping at a second rate, which is less than the first rate.<sup>10</sup> More preferably,

---

<sup>3</sup> See page 1, lines 18-20 of the Specification.

<sup>4</sup> See page 1, lines 21-25 of the Specification.

<sup>5</sup> See page 1, lines 26-29 of the Specification.

<sup>6</sup> See page 4, lines 21-24; page 5, lines 6-12 of the Specification.

<sup>7</sup> See page 4, lines 8-10 and 26-28 of the Specification.

<sup>8</sup> See Figure 2; page 3, lines 17-20 of the Specification.

<sup>9</sup> See page 4, lines 30-32 of the Specification.

<sup>10</sup> See page 2, lines 21-24; page 5, lines 17-29 of the Specification.

the first portion slopes between about one and two slot pitches, and the second portion slopes between about one-half and one and one-half slot pitches.<sup>11</sup>

## **VI. ISSUES**

The issue is whether claims 1 and 3-10 are patentable under 35 U.S.C. § 103(a).

## **VII. GROUPING OF CLAIMS**

Appellants contend that the claims of the present invention do not stand or fall together. In particular, the following groups of claims are separately patentable:

Group 1: Claims 1 and 9 stand together.

Group 2: Claims 3-8 stand together.

Group 3: Claim 10 stands alone.

The claim(s) in each group is (are) separately patentable from the claim(s) in any other group.

## **VIII. ARGUMENTS**

### **A. Argument Directed to the Allowance of Selected Groupings of the Claims**

Claims 1 and 3-10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Inagaki et al. (U.S. Patent No. 4,201,930) in view of Kometani et al. (U.S. Patent No. 6,433,455). Claim 10 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Inagaki et al. in view of Kometani et al., and further in view of Kusase et al. (U.S. Patent No. 5,122,705). For the reasons to appear hereinafter, claims 1 and 3-10 are patentable, and thus the rejections under 35 U.S.C. § 103(a) should be reversed, and a *Notice Allowance and Issue Fee Due* should issue.

#### **1. Argument for Allowance of the Claims of Group 1 (Claims 1 and 9)**

As set forth in the Final Office Action dated October 24, 2002, claims 1 and 3-9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Inagaki et al. in view of Kometani et al. In particular, the Office asserted that it would have been obvious to one of ordinary skill in the art at the time the invention was made to include in the leading side of a

---

<sup>11</sup> See page 5, lines 30-32 through page 6, lines 1-4 of the Specification.

rotor tooth, a plurality of portions in an axial direction, wherein a first portion extends from the tip sloping towards the base at a first rate, and a second portion that extends from the first portion sloping towards the base of the tooth at a second rate that is less than the first.

The M.P.E.P. § 706.02(j), citing controlling Federal Circuit precedent, sets forth the burden that the Office must carry in order to reject claims based on obviousness:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.<sup>12</sup>

Thus, to support the conclusion that the claimed invention is directed to obvious subject matter, the Federal Circuit has held that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant's disclosure.<sup>13</sup> Likewise, the Board has held that the claimed invention is directed to obvious subject matter only if either the references expressly or implicitly suggest the claimed invention, or a convincing line of reasoning is presented by the Examiner as to why an artisan would have found the claimed invention to have been obvious in light of the teachings of the cited references.<sup>14</sup>

A conclusion of obviousness for claims 1 and 9 cannot be supported because (i) the combination of the Inagaki et al. and Kometani et al. references is improper as there is no incentive or motivation to combine the references; and (ii) there is no likelihood of success in achieving the benefits of the claimed invention by combining the references as proposed by the Examiner.

---

<sup>12</sup> *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q. 2d 1438 (Fed. Cir. 1991)

<sup>13</sup> *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q. 2d 1438 (Fed. Cir. 1991)

<sup>14</sup> *See Ex parte Clapp*, 227 U.S.P.Q. 972, 973. (Bd. Pat. App. & Inter. 1985).

The Examiner has not established a proper motivation or incentive in the art to support the proposed combination of references. In this regard, the Examiner has stated in the Final Office Action dated October 24, 2002 that “Inagaki et al. show an alternating current (AC) generator including an armature core having a plurality of teeth separated by intervening slots with a slot pitch, at least one multiphase winding disposed on said armature core, and a rotor disposed in said armature having a plurality of pairs of rotor poles and configured to rotate with a shaft, said shaft having an axis associated therewith, each pair respectively configured for energization in opposite magnetic polarity, said poles comprising a trapezoidal shape having a base, a leading side, a trailing side, and a tip side, said trailing side is a straight line between the tip side and the base.”<sup>15</sup> However, the Examiner conceded that “Inagaki et al. do not show said leading side having a plurality of portions in an axial direction, wherein said leading side has a first portion extending from the tip side sloping at a first rate, said leading side having a second portion extending from said first portion sloping at a second rate less than [sic] said first rate.”<sup>16</sup>

However, the Examiner then stated that “Kometani et al. show said leading side having a plurality of portions in an axial direction, wherein said leading side having a second portion extending from the tip side sloping at a first rate, said leading side having a second portion extending from said first portion sloping at a second rate less than [sic] said first for the purpose of increasing output at low speed.”<sup>17</sup> Accordingly, the Examiner asserted that “[s]ince Inagaki et al. and Kometani et al. are from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of others.”<sup>18</sup> Appellants respectfully disagree.

As an initial matter, it must be understood that the design of rotors, and the associated parts thereof, in AC generators is a highly complex endeavor. High-level, sophisticated, and complex mathematical modeling techniques are utilized in designing each

---

<sup>15</sup> Final Office Action dated October 24, 2002 page 3, lines 3-11.

<sup>16</sup> Final Office Action dated October 24, 2002 page 3, lines 12-15.

<sup>17</sup> Final Office Action dated October 24, 2002 page 3, lines 17-20.

<sup>18</sup> Final Office Action dated October 24, 2002 page 4, lines 1-3.



variation of these devices, and one design is not interchangeable with another. To support this assertion, Appellants refer to the cited art. For instance, the rotor tooth of Inagaki et al. was carefully crafted using techniques such as the analysis of a second order trigonometric equation for the magnetic flux produced by the generator and the use of Fourier transforms to model a waveform to cancel the electromagnetic noise, where the new waveform has the same frequency, but with a 180-degree phase shift, as the waveform causing the electromagnetic noise.<sup>19</sup> Each new design for rotors and their associated parts requires the above painstaking analysis to ensure that the design will be operational in the first instance, and achieve the desired benefits in the second instance. Accordingly, one cannot simply take one part of a design from one invention, and another part of a design from another independent invention, and combine them to develop a third, invention without carefully analyzing a multitude of variables.

In light of the foregoing, Appellants respectfully submit that simply modifying Inagaki et al. in view of Kometani et al. as proposed is not proper. The result of the modeling techniques set forth above with respect to the invention of Inagaki et al. was the design of an asymmetrical, irregular trapezoid, where the narrow end of the tooth is offset from a vertical axis by a narrow range of 2 mm-6 mm, which corresponds to a slot pitch of 0.2-0.7.<sup>20</sup> Kometani et al. disclose a symmetrical rotor tooth having a substantially trapezoidal shape with multi-segmented leading and trailing sides. In this reference, an analysis of the current flow out of the generator when the generator is at its saturation point is carried out,<sup>21</sup> as well as an analysis of the voltage produced by the generator at extremely low speed revolution.<sup>22</sup> Kometani et al. concludes that to maximize the magnetic flux out of the generator while minimizing noise, the rotor tooth should be designed so that it is substantially symmetric with respect to a vertical axis, and that the leading and trailing sides should have skew angles designed such that the bottom 2/3 of the tooth is supplied with at least 95% of the total

---

<sup>19</sup> See Inagaki et al. at Column 3, lines 5-16 and 32-40.

<sup>20</sup> See Inagaki et al. at Column 4, lines 37-42; Claim 1, lines 20-21; and Figure 7.

<sup>21</sup> See Kometani et al. at Column 1, lines 56-67; and Column 2, lines 1-10.

<sup>22</sup> See Kometani et al. at Column 2, lines 40-50.

magnetic flux generated.<sup>23</sup> There is no support to believe, and the Examiner has pointed to none, that taking only the leading side of the tooth profile of Kometani et al., rather than both the leading and trailing sides, and using it to modify Inagaki et al. would allow the realization of the benefit of increased output at low speed. The result is an asymmetrical rotor tooth, not symmetrical, as required by Kometani et al. While these references both pertain to rotors of AC generators, one of ordinary skill in this complex area of art would understand the complex teachings of Inagaki et al. or Kometani et al., and would realize that the proposed combination would not achieve the proposed benefits. One of ordinary skill would not, therefore, find an incentive or motivation to combine these references.

Similarly, because of the complex techniques involved in creating an optimal, extremely precise geometric shape for a rotor tooth, Appellants respectfully submit that a person of ordinary skill in the art would not have a reasonable expectation of success in forming an effective rotor tooth by merely importing the multi-segmented leading side from Kometani et al. For example only, a rotor tooth under Inagaki et al. where the narrow end of the tooth is offset from a vertical axis by just 1 mm<sup>24</sup> (low end range) or by 7 mm (high end range), would not effectively cancel magnetic noise.<sup>25</sup> In other words, Inagaki et al. teaches that the smallest changes in the offset of the narrow end of the rotor tooth from a vertical axis outside of the 2 mm-6 mm range will not work for the intended purpose.

Following this line of reasoning along its logical progression and applying it to the facts of the present case, if such a small change in the Inagaki et al. reference will result in the invention in the reference not achieving its intended purpose, then dramatically altering the design of Inagaki et al. with some of the features of Kometani et al., as proposed by the Examiner, will likewise result in not achieving the intended purpose of the invention. Going a step further, Appellants respectfully submit that the proposed modifications of the Inagaki et al. reference by the Examiner may even destroy its noise cancellation effect. It cannot be

---

<sup>23</sup> See Kometani et al. at Column 5, lines 15-21, lines 26-38; Figure 2, Claim 2.

<sup>24</sup> For a slot pitch of 8.5 mm.

<sup>25</sup> "Particularly, in the range of  $D = 2$  to  $6$  mm, that is, in the range where the ratio of  $D$  to the slot pitch  $= 8.5$  mm is in the range of  $0.2$  to  $0.7$ , the output showed practically no decrease and the exciting force was decreased greatly thus showing that a remarkable effect is obtainable in this particular range." Column 4, lines 37-42.

obvious to propose a modification that would destroy the reference.<sup>26</sup> Moreover, changing the leading edge of Inagaki et al. would change its principle of operation, since the principle of operation was worked out by Inagaki et al. mathematically only for the disclosed geometry. There is no incentive to modify a reference where the modification would change the principle of operation.<sup>27</sup> Therefore, because there is no reasonable expectation of success, the combination of the references is improper.

Accordingly, the rejection of claims 1 and 9 is respectfully submitted to be improper, and Appellants respectfully request reversal of the rejection.

## **2. Argument for Allowance of the Claims of Group 2 (Claims 3-8)**

As set forth in the Final Office Action dated October 24, 2002, claims 3-9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Inagaki et al. in view of Kometani et al.

Claims 3-8 depend from base claim 1, and therefore, contain all of the limitations thereof, and for at least the same reasons set forth above in connection with the base claim 1, claims 3-8 are submitted to be patentable, and the rejection should be reversed. Moreover, in addition, the subject claims recite varying rates of slope for the leading side of the tooth. For example, claim 3 recites a rate of slope between one and two slot pitches for the first portion of the leading side, and a rate of slope between one-half and one and one-half slot pitches for the second portion of the leading side. The Examiner stated that it would have been obvious to make the first and second portions of the leading side with these range of slope because it has been held that “discovering an optimum value of a result effective variable involves only routine skill in the art.” In view of the above discussion regarding the state of the art in designing these devices, as well as the non-interchangeability of these designs, Appellants submit that the Examiner has not satisfied his burden of establishing a prima facie case of obviousness. The rejection should be reversed.

---

<sup>26</sup> See *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

<sup>27</sup> See *In re Ratti*, 270 F.2d 810, 813, 123 USPQ 349, 352 (CCPA 1959).

As discussed in detail above, complex mathematical modeling techniques must be employed for each variation of these devices and their associated parts, therefore, it is not routine to determine the optimal values of slope for the first and second portions. Rather, in light of the arguments set forth above regarding claim 1, Appellants submit that it is quite the opposite. Accordingly, even if the proposed combination were proper (which it is not), not all of the limitations would be met because neither reference discloses any rate of slope, let alone the specific rates recited in the claims of the present invention. Therefore, for at least this additional reason as well, the rejection of claims 3-8 is submitted to be improper, and Appellants respectfully request that the rejection be reversed.

### **3. Argument for Allowance of the Claim of Group 3 (Claim 10)**

As set forth in the Final Office Action dated October 24, 2002, claim 10 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Inagaki et al. in view of Kometani et al., and further in view of Kusase et al. (U.S. Patent No. 5,122,705).

The Examiner has stated that “the generator of Inagaki et al. modified by Kometani et al. includes all of the limitations of the claimed invention with a three-phase winding, the trailing side being disposed at an incline relative to the axial extent of the teeth of the armature, the trailing side extending parallel with the leading side of an adjacent pole of a predetermined length except for the generator including 72 teeth and six pairs of poles.”<sup>28</sup> The Examiner further states that “Kusase et al. show the generator including 72 teeth and six pairs of poles for the purpose of reducing noise.”<sup>29</sup> The Examiner concluded that “[s]ince Inagaki et al., Kometani et al., and Kusase et al. are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of others.”<sup>30</sup>

Claim 10 depends from base claim 9, and therefore, contains all of the limitations thereof, and for at least the same reasons set forth above in connection with base claim 9 and claim 1 regarding the lack of incentive or motivation to combine the Inagaki et al. and

---

<sup>28</sup> Final Office Action dated October 24, 2002, page 5, lines 11-16.

<sup>29</sup> Final Office Action dated October 24, 2002, page 5, lines 17-18.

<sup>30</sup> Final Office Action dated October 24, 2002, pages 5, lines 19-21.

Kometani et al. references, claim 10 is submitted to be patentable, and the rejection should be reversed.

In addition, the Examiner must show an incentive or motivation at two steps (combining Kometani et al. and Inagaki et al.; and modifying modified Inagaki et al. with Kusase et al.), but has not. Appellants submit that because it is not proper to combine the Inagaki et al. and Kometani et al. references, as set forth above, it is likewise improper to combine Kusase et al. with the proposed combination. Moreover, the Examiner's reasoning that Kusase et al. teach a generator having 72 teeth and six poles which serves the purpose of reducing noise does not support the combination of this reference with the others. The Examiner has mistaken what Kusase et al. teach with respect to the reduction of noise. Appellants respectfully submit that Kusase et al. do not disclose that the 72 teeth, six pole configuration of Kusase et al. reduces noise, but rather Kusase et al. disclose that it is the method of winding two separate three-phase armature windings in an offsetting pattern that accomplishes this purpose. Therefore, because Kusase et al. fails to teach what the Examiner claims it teaches, it is not proper to combine it with the other references to render the present invention obvious. Accordingly, for at least the additional reason that the Examiner has not shown a motivation to combine the references at the second step of the analysis, Appellants submit that claim 10 is patentable and request that this rejection be reversed.

## **B. Conclusion**

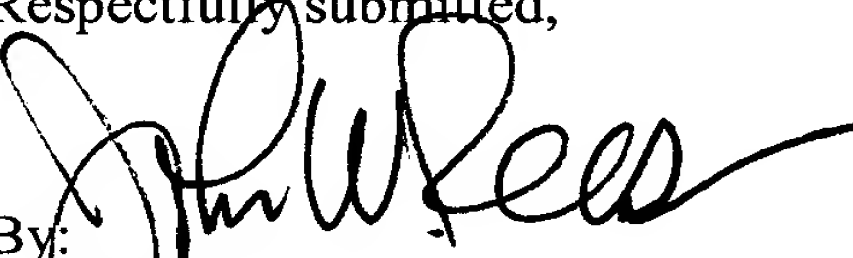
Any teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the available references, and not based on Applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Furthermore, M.P.E.P. § 2142 states that:

To establish a prima facie case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

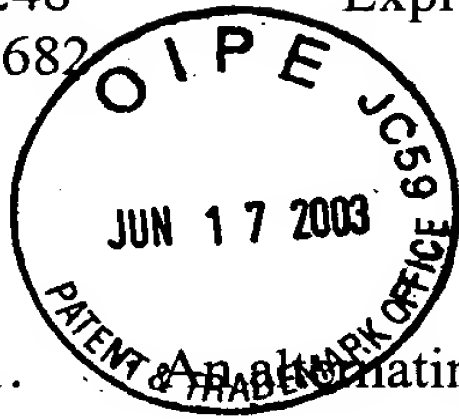
None of the cited references suggest an AC generator, or a rotor tooth of an AC generator, as recited in claims 1 and 3-10. Hence, the Examiner has clearly erred with respect to the patentability of the claimed invention. It is respectfully requested that the Board reverse the Examiner's rejection of all pending claims, and hold that the claims are not rendered obvious by the cited reference(s). However, should the Board find the arguments herein in support of independent claims 1 and 9 unpersuasive, the Board is respectfully requested to carefully consider the arguments set forth above in support of each of the independently patentable groups.

Date: 17 June 2003

Respectfully submitted,

By: 

John W. Rees  
Registration No. 38,278  
Attorney for Appellants  
Dykema Gossett PLLC  
39577 Woodward Avenue, Suite 300  
Bloomfield Hills, Michigan 48304-5086  
(248) 203-0832  
jrees@dykema.com



## IX. APPENDIX

1. An alternating current (AC) generator including an armature core having a plurality of teeth separated by intervening slots with a slot pitch, at least one multiphase winding disposed on said armature core, and a rotor disposed in said armature having a plurality of pairs of rotor poles and configured to rotate with a shaft, said shaft having an axis associated therewith, each pair respectively configured for energization in opposite magnetic polarity, said poles comprising a trapezoidal shape having a base, a leading side, a trailing side, and a tip side, said leading side having a plurality of portions in an axial direction, said trailing side is a straight line between the tip side and the base, wherein said leading side has a first portion extending from said tip side sloping at a first rate, said leading side having a second portion extending from said first portion sloping at a second rate less than said first rate.

3. The AC generator of claim 1 wherein said first portion slopes between one and two slot pitches and said second portion slopes between one-half and one and one-half slot pitches.

4. The AC generator of claim 3 wherein said first portion slopes one slot pitch, said second portion slopes about three-quarters slot pitch.

5. The AC generator of claim 1 wherein said tip side is offset relative to said base, wherein said leading side has a first portion extending from said tip sloping at a first rate, said leading side having a second portion extending from said first portion sloping at a second rate less than said first rate.

6. The AC generator of claim 5 wherein said first portion slopes between one and two slot pitches and said second portion slopes between one-half and one and one-half slot pitches.

7. The AC generator of claim 6 wherein said first portion slopes one slot pitch, said second portion slopes three-quarters slot pitch.



8. The AC generator of claim 5 wherein said offset is in a direction of rotation of said rotor.

9. An alternating current (AC) generator including an armature core having a plurality of teeth separated by intervening slots with a slot pitch, at least one multiphase winding disposed on said armature core, and a rotor disposed in said armature having a plurality of pairs of rotor poles and configured to rotate with a shaft, said shaft having an axis associated therewith, each pair respectively configured for energization in opposite magnetic polarity, said poles comprising a trapezoidal shape having a base, a leading side, a trailing side, and a tip side, said leading side having a plurality of portions in an axial direction, wherein said tip side is offset relative to said base, wherein said leading side has a first portion extending from said tip sloping at a first rate, said leading side having a second portion extending from said first portion sloping at a second rate less than said first rate, said first portion slopes between one and two slot pitches and said second portion slopes between one-half and one and one-half slot pitches, wherein said trapezoidal shape further includes a pair of shank portions extending from said base, said trailing side is a straight line in the axial direction between said tip side and one of said shank portions extending from said base.

10. The generator of claim 9 wherein said generator includes seventy-two teeth and six pairs of poles, said multiphase winding is a three-phase winding and wherein said trailing side is disposed at an incline relative to the axial extent of said teeth of said armature, said trailing side extending in parallel with said leading side of an adjacent pole for a predetermined length.



06-18-03

AFB/2834

## TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No.  
DP-302,682In Re Application Of:  
BUENING, ET AL.Serial No.  
09/900,248Filing Date  
07/06/2001Examiner  
LE, DANG DGroup Art Unit  
2834

Invention: ROTOR FOR AN AC GENERATOR

TO THE COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on

The fee for filing this Appeal Brief is: \$320.00

- ☐ A check in the amount of the fee is enclosed.
- ☐ The Director has already been authorized to charge fees in this application to a Deposit Account.
- ☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 04-2223

Signature

Dated: June 17, 2003

J hn W. Rees (Reg No. 38,278)  
Dykema Gossett PLLC  
Suite 300  
39577 Woodward Avenue  
Bloomfield Hills, Michigan 48304  
(248) 203-0832

I certify that this document and fee is being deposited  
on June 17, 2003 with the U.S. Postal Service as  
first class mail under 37 C.F.R. 1.8 and is addressed to the  
Commissioner for Patents, P.O. Box 1450, Alexandria, VA  
22313-1450.

Signature of Person Mailing Correspondence

Lori A. Tersigni

Typed or Printed Name of Person Mailing Correspondence

CC: